

WHAT IS CLAIMED IS:

- 1 1. A resin-encapsulated semiconductor apparatus comprising a
2 semiconductor device having a ferroelectric film and a surface-protective film,
3 and a encapsulant member comprising a resin;
4 said surface-protective film being formed of a polyimide.
- 1 2. The resin-encapsulated semiconductor apparatus according to
2 claim 1, wherein said polyimide has a glass transition temperature of from
3 240°C to 400°C and a Young's modulus of from 2,600 MPa to 6 GPa.
- 1 3. The resin-encapsulated semiconductor apparatus according to
2 claim 1, wherein said ferroelectric film is a capacity insulation film of a
3 capacitor.
- 1 4. The resin-encapsulated semiconductor apparatus according to
2 claim 1, wherein said polyimide is obtained by heating a polyimide precursor
3 composition at a temperature of 230°C or above and 300°C or below.
- 1 5. The resin-encapsulated semiconductor apparatus according to
2 claim 1, wherein said polyimide;
3 is obtained by heating a polyimide precursor composition at a
4 temperature of higher than 300°C and 350°C or below for a time shorter than 4
5 minutes; and
6 has a Young's modulus of 3,500 MPa or above and a glass transition

7 temperature of 260°C or above.

1 6. A process for fabricating a resin-encapsulated semiconductor
2 apparatus, comprising the steps of;
3 forming a film of a polyimide precursor composition on the surface
4 of a semiconductor device having a ferroelectric film;
5 heat-curing the polyimide precursor composition film to form a
6 surface-protective film formed of a polyimide; and
7 encapsulating, with an encapsulant resin, the semiconductor device
8 on which the surface-protective film has been formed.

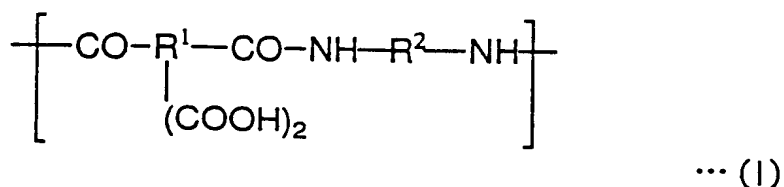
1 7. The process for fabricating a resin-encapsulated semiconductor
2 apparatus according to claim 6, wherein the polyimide has a glass transition
3 temperature of from 240°C to 400°C and a Young's modulus of from 2,600
4 MPa to 6 GPa.

1 8. The process for fabricating a resin-encapsulated semiconductor
2 apparatus according to claim 6, wherein the step of heat-curing comprises a
3 step of curing said polyimide precursor composition film by heating at a
4 temperature of 230°C or above and 300°C or below.

1 9. The process for fabricating a resin-encapsulated semiconductor
2 apparatus according to claim 6, wherein;
3 the step of heat-curing comprises a step of heating at a temperature
4 of 300°C or above and 350°C or below; and
5 said polyimide has a Young's modulus of 3,500 MPa or above and a

6 glass transition temperature of 260°C or above.

1 10. The process for fabricating a resin-encapsulated
2 semiconductor apparatus according to claim 6, wherein said polyimide
3 precursor composition contains as a polyimide precursor a polyamic acid
4 comprised of a repeating unit represented by the following general formula
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11 wherein R¹ is at least one of tetravalent aromatic organic groups shown in
12 the following chemical formula group (II), and R² is at least one of divalent
13 aromatic organic groups shown in the following chemical formula groups (III)
14 and (IV) :

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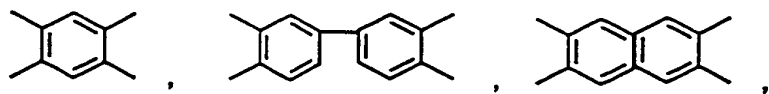
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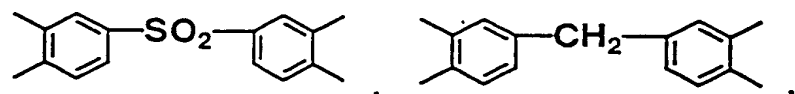


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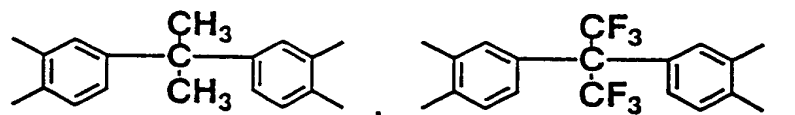
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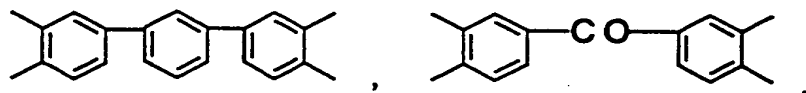
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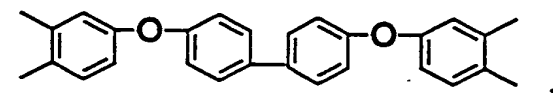
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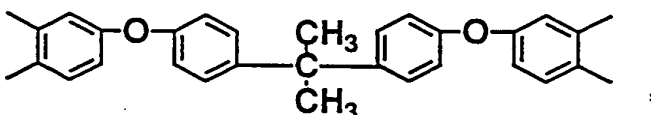
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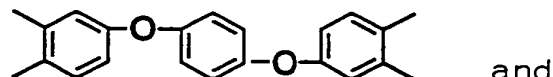
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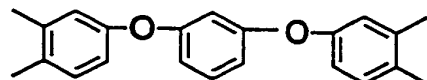
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... (II)

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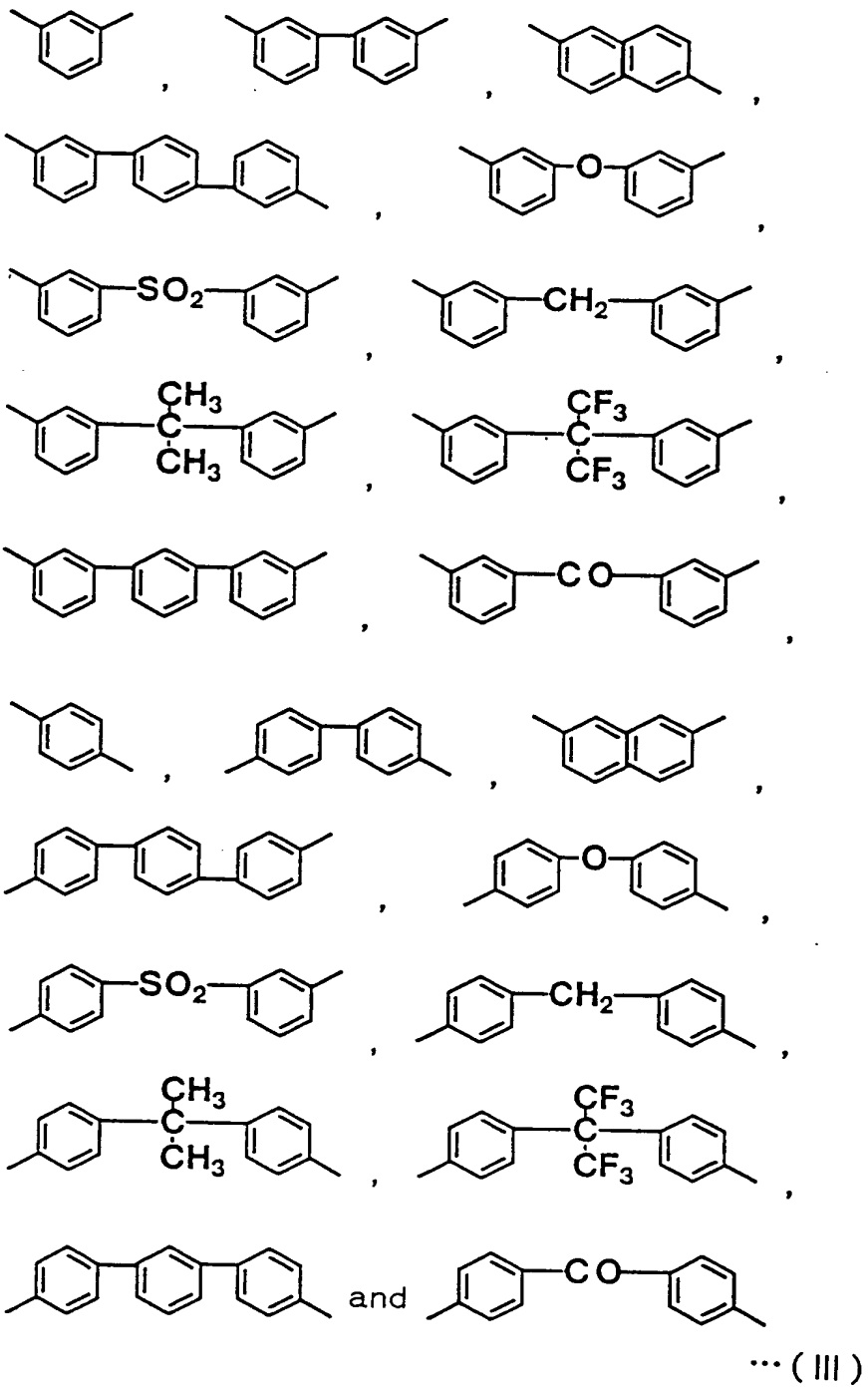
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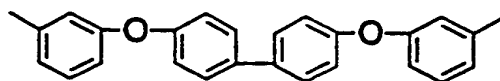
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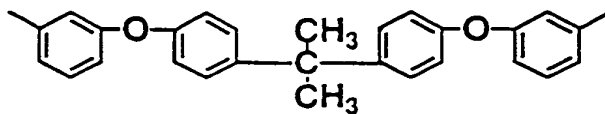
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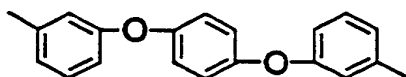
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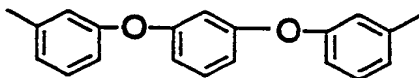
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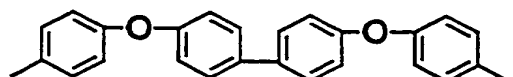
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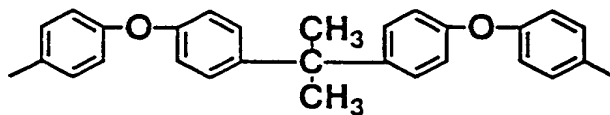
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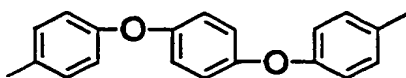
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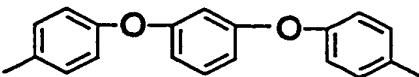
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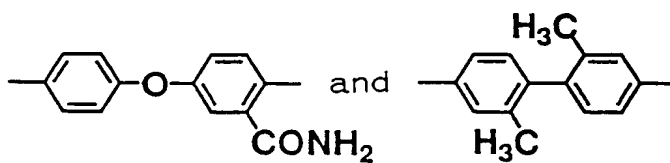
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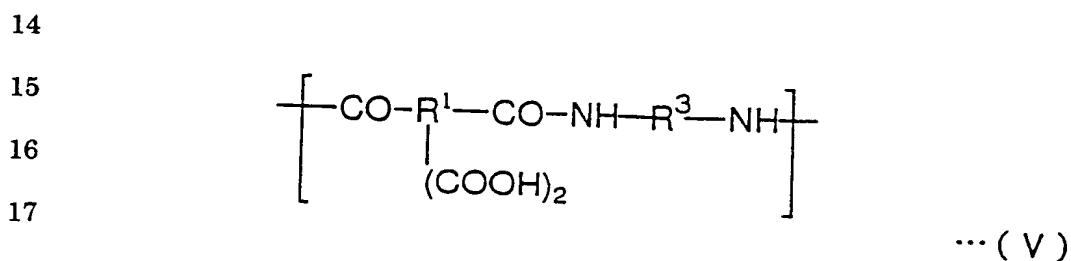
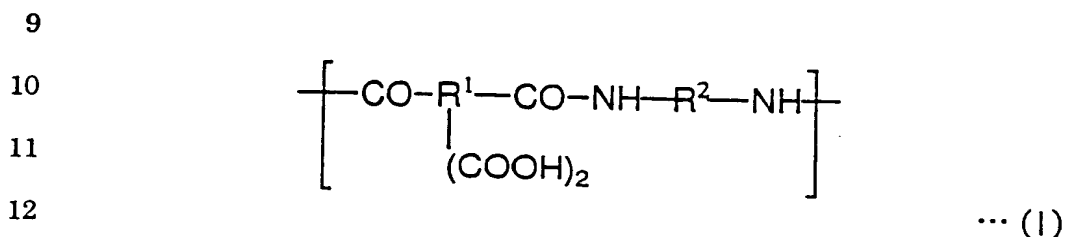
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... (IV)

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1 11. The process for fabricating a resin-encapsulated
 2 semiconductor apparatus according to claim 6, wherein said polyimide
 3 precursor composition contains as a polyimide precursor a polyamide acid
 4 comprised of a first repeating unit represented by the following general
 5 formula (I) and a second repeating unit represented by the following general
 6 formula (V): the proportion of the number of said second repeating unit to the
 7 total number of said first repeating unit and second repeating unit being 10%
 8 or less;



19 wherein R¹ is at least one of tetravalent aromatic organic groups shown in
 20 the following chemical formula group (II):

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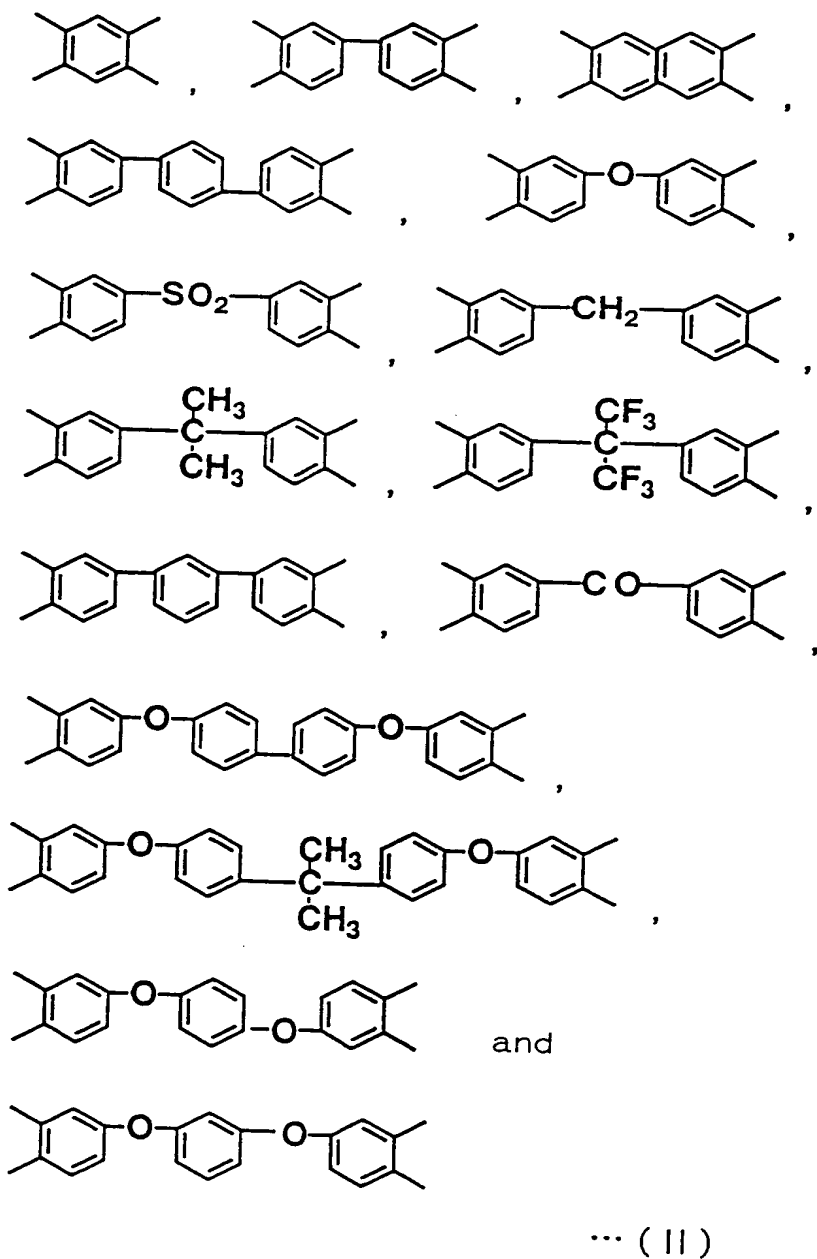
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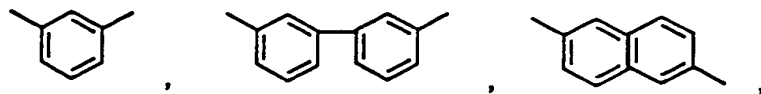
R^2 is at least one of divalent aromatic organic groups shown in the following chemical formula groups (III) and (IV):

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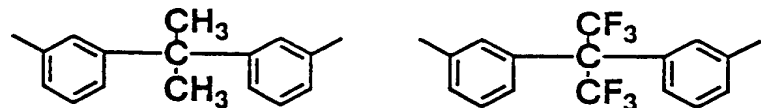
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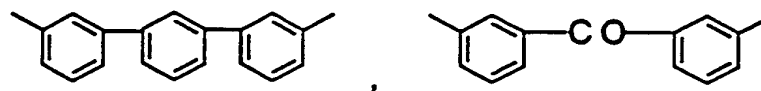
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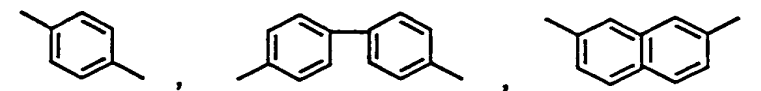
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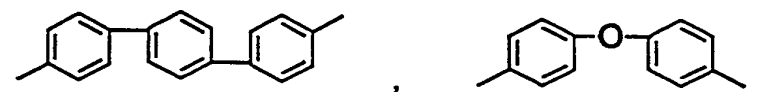
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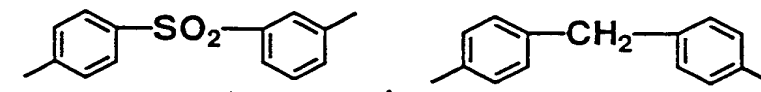
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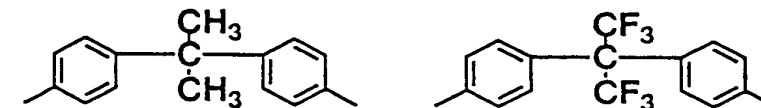
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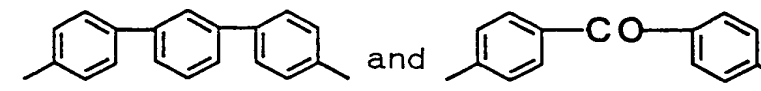
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... (III)

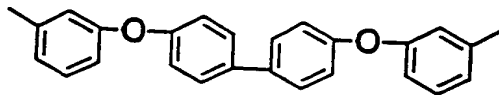
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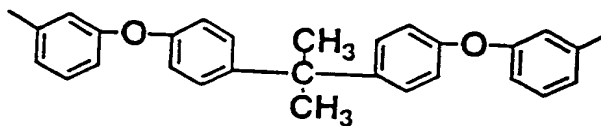
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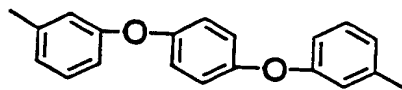
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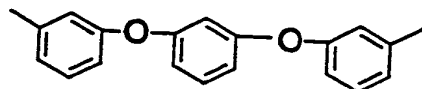
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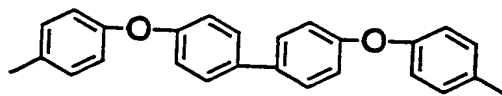
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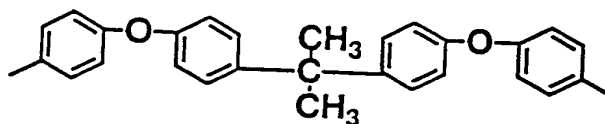
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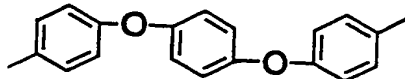
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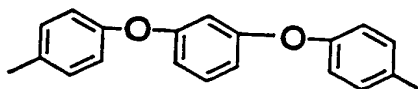
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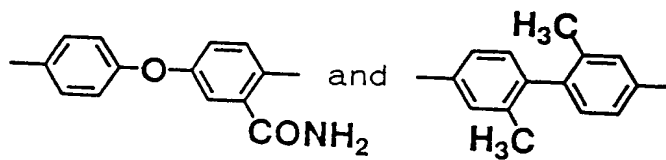
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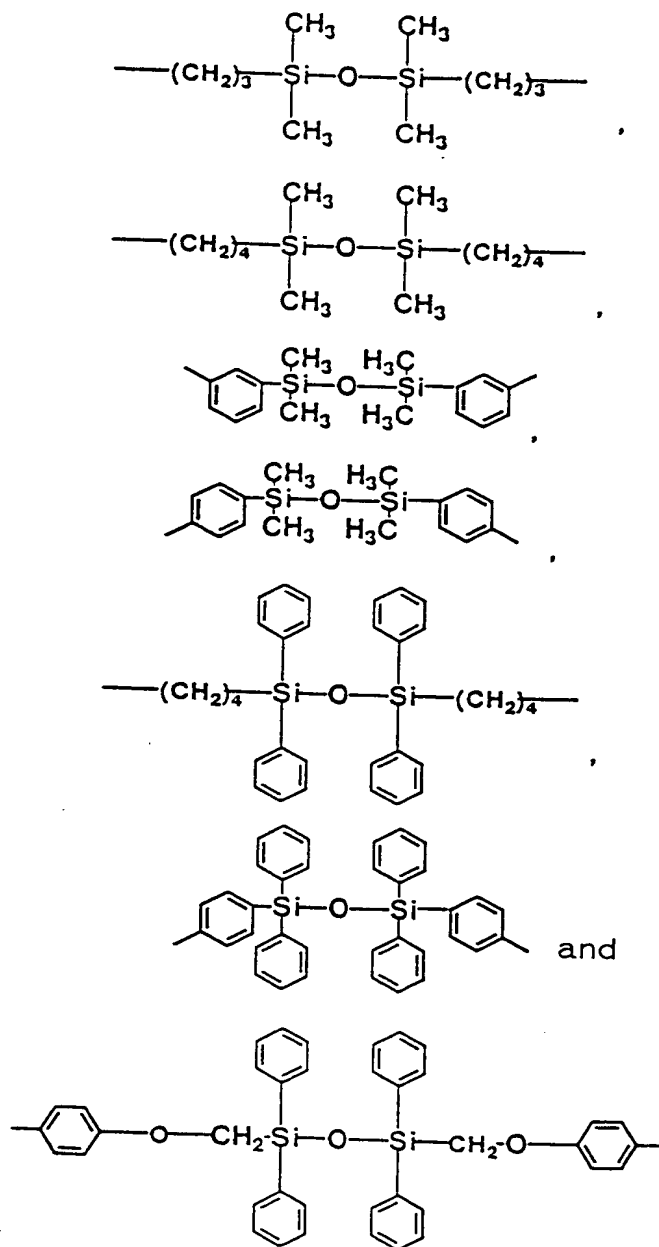
and

CONH₂H₃C

; and

... (IV)

105 R³ is at least one of divalent silicon-containing organic group shown in the
 106 following chemical formula group (VI):



... (VI)

1 12. The process for fabricating a resin-encapsulated
2 semiconductor apparatus according to claim 6, wherein the heating in the
3 step of heat-curing is carried out using a hot plate.

1 13. A process for fabricating a resin-encapsulated laminated
2 device, comprising the steps of;
3 forming a film of a polyimide precursor composition on the surface
4 of a laminate having a ferroelectric film;
5 heat-curing the polyimide precursor composition film to form a film
6 of a polyimide having a glass transition temperature of from 240°C to 400°C
7 and a Young's modulus of from 2,600 MPa to 6 GPa; and
8 encapsulating, with an encapsulant resin, the laminate on which
9 the polyimide film has been formed.